AMERICAN MUSEUM NOVITATES

Number 700 | Published by THE AMERICAN MUSEUM OF NATURAL HISTORY New York City | March 10, 1934

59.51,8 (74.1)

THE DISTRIBUTION OF ROTIFERA ON MOUNT DESERT ISLAND. PART V[1]

A NEW SPECIES OF SYNCHAETIDAE AND NEW SPECIES OF ASPLANCHNIDAE, TRICHOCERCIDAE, AND BRACHIONIDAE

BY FRANK J. MYERS

The previous parts of the present work were devoted to new species belonging to the family Notommatidae. In this part a number of new and distinctive species, belonging to several families, are figured and described, as it is felt that these rotifers should be placed on record. Most of the species have been known for a number of years, having been originally found in Atlantic County, New Jersey, and later found again on Mount Desert Island. The rotatorian fauna of southern New Jersey, northern Wisconsin, and Mt. Desert Island is closely approximate.

New species described in this paper are as follows:

Asplanchnidae
Asplanchnopus dahlgreni
Synchaetidae
Ploesoma formosum
Trichocercidae
Trichocerca platessa
Trichocerca ornata
Brachionidae
Macrochaetus multispinosus
Macrochaetus longipes
Colurella logima
Colurella aemula

ORDER **PLOIMA**

Family **Asplanchnidae**

Asplanchnopus dahlgreni, new species

Figure 1

The body is stout, being very gibbous dorsally and nearly straight ventrally. The posterior portion is separated from the head by a slight constriction which is faintly striated. There are three humps: one dorsal which is directed forward, and two lateral which are directed backward.

[1]The preceding parts of this article appeared in American Museum Novitates as follows: part I (not numbered) in No. 494, Sept. 28, 1931; part II in No. 659, Sept. 15, 1933; part III in No. 660, Sept. 15, 1933; part IV in No. 699.

The corona is reduced to a circumapical band of long locomotor cilia, interrupted by a dorsal and a ventral gap and, laterally, by two small protuberances each bearing a red pigment-spot. There are a pair of prominent tubules on the apical area from which emerge tufts of sensory setae. The foot is about one-fifth the length of the

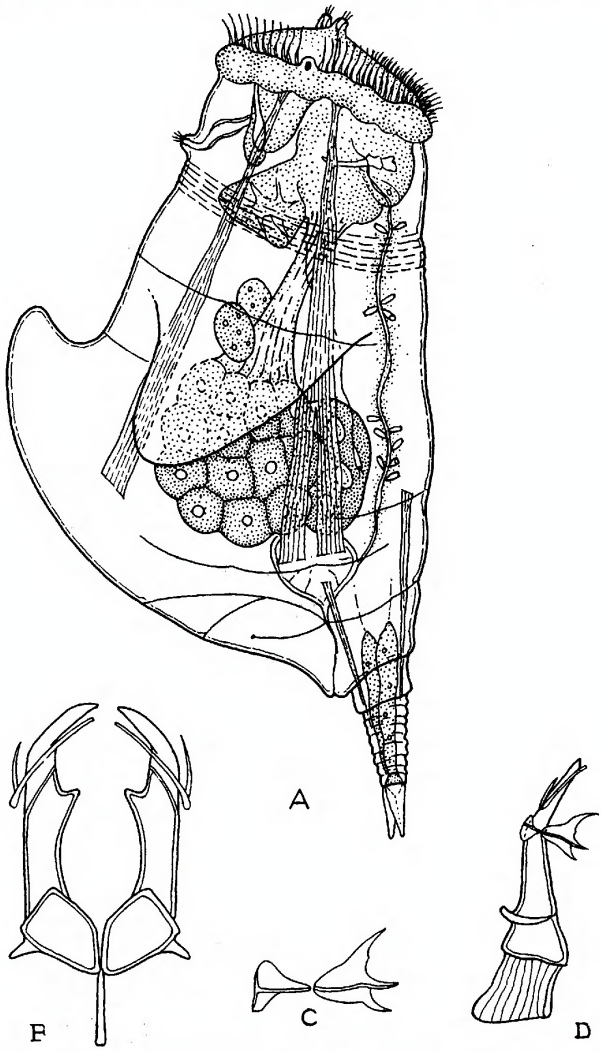


Fig. 1. *Asplanchnopus dahlgreni*, new species.
A, lateral view; B, incus, ventral view; C, uncus and manubrium; D, trophi, lateral view.

body and consists of two joints. The basal joint is short and stout; the terminal joint is relatively long and transversely wrinkled. The toes are short, triangular, and laterally compressed.

The dorsal antenna is prominent, and two nerve fibers pass from it to the ganglion. The lateral antennae are situated on each side of the body opposite the ovary.

The mastax is of the incudate type. The fulcrum is reduced to a quadrangular plate which is nearly as long as it is broad. Each ramus carries a prominent triangular tooth on the inner margin, and a strong apophysis near the base of the external edge. The mallei are much reduced. Each uncus has one rudimentary tooth attached to a weblike plate which articulates with the trifid manubrium. There is a slender curved rod, superimposed on the extremity of each ramus, that corresponds to a similar structure in the trophi of *Harringia eupodia* (Gosse), (De Beauchamp, 1912, *op. cit.*, p. 328). In this case, these rods are probably remnants of the dorsal tooth of the uncus which have become completely detached.

A stout esophagus leads to the stomach which is thick-walled and has prominent cells for the absorption of the products of digestion. The ovary is small and round. There are twelve flame cells, attached to the nephridial tubes, on each side of the intestinal tract: seven at the level of the ovary, three just below the gastric glands, and two just posterior to the mastax. The bladder is normal. The foot glands are long and extend for some distance into the body cavity.

The retrocerebral sac is small and clear; the subcerebral glands are slightly shorter than the sac. There is no eyespot attached to the ganglion.

Average length, 550μ; foot, 72μ; toes, 35μ.

HABITAT.—Littoral region of acid-water lakes and ponds.

Asplanchnopus dahlgreni is evenly distributed, although never abundant, throughout the Island. It has also been collected in Atlantic County, New Jersey. So far as is known this species is oviparous, at least nothing has been observed that would indicate the contrary. The humpless form has not been seen and it is doubtful whether this rotifer is dimorphic. When the animal is fully extended and actively moving about, there are three deep crevices in the dorsal integument. The humps are only apparent when the rotifer contracts, at which time they are evaginated by hydrostatic pressure.[1]

The peculiar "punch-like" shape of the dorsal hump, directed forward, the absence of a cervical eyespot, the number and arrangement of the flame cells, the long wrinkled, terminal foot joint, the round ovary, and the differences in the trophi readily distinguish this from the remaining species of the genus.

The principal differences between the species of *Asplanchnopus* are:

Asplanchnopus multiceps (Schrank).—No humps; double dorsal antenna; one cervical and two accessory frontal eyespots; ovary horseshoe-shaped; foot very short; fifty or more flame cells on each side; rami without denticulation on inner margins; viviparous.

Asplanchnopus hyalinus Harring.—No humps; double dorsal antenna; one cervical and two frontal accessory eyespots; ovary ribbon-shaped; foot long, telescopically jointed; eight flame cells on each side; rami without denticulation on inner margins; oviparous.

[1]The figure shows this rotifer fully extended, with the humps everted, in order to save a duplication of figures.

Asplanchnopus dahlgreni Myers (new species).—Three humps; single dorsal antenna; two coronal eyespots, cervical eyespot wanting; ovary round; foot long, terminal joint transversely wrinkled; rami with one stout tooth on each inner margin; oviparous.

Family **Synchaetidae**

Ploesoma formosum, new species

Figures, 2, 3, 4

The body is roughly quadrangular from the lateral view; it is rhomboidal, truncate anteriorly, and pointed posteriorly from the dorsal view. The adult females are invariably pigmented a deep yellowish-red. The lorica is divided into definite areas bounded by ridges, and the spaces between the ridges are ornamented by small

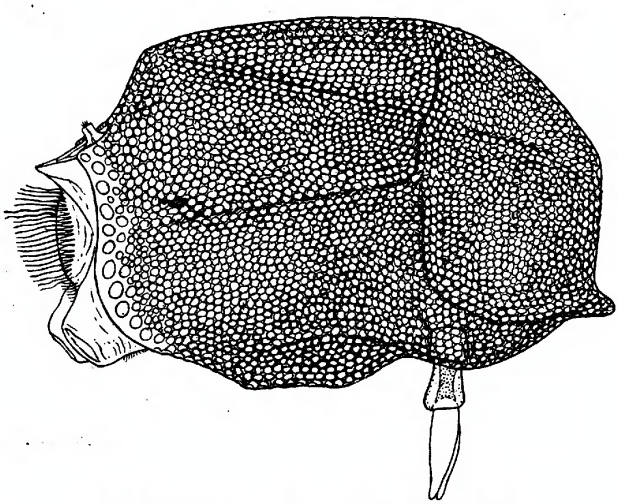


Fig. 2. *Ploesoma formosum,* new species.
Lateral view.

fossettes which are large and widely spaced near the frontal margin. The anterior dorsal margin is undulate and, in the middle, there is a deep, sub-square sinus, for the emergence of the dorsal antenna. The ventral anterior margin is a deeply excised oval arc. The foot is ventrally placed, and is composed of two joints which emerge through an ovate opening of the lorica, situated just back of the middle of the venter. The toes are stout, blade-shaped and lanceolate.

The corona is composed of a supraoral, triangular buccal plate of short, densely set cilia, and a circumapical band reduced to two lateral arcs of strong locomotor cilia. On each side of the mouth there is a retractile, cuticular boss which is invaginated in the central portion.

The lateral antennae emerge from a papillose prominence, situated at the junction of the median lateral ridge of the lorica with the perpendicular ridge. The dorsal antenna is prominent and tubular. The mastax is of a modified virgate type and the trophi are asymmetric. The fulcrum is long, slightly expanded and serrate posteriorly.

The rami are roughly triangular, the left being larger than the right; there are no teeth or other denticulation on their inner margins. Near mid-length they are bent at a right angle to the fulcrum. The left uncus has a slender preuncal tooth followed by a long, stout tooth clubbed near the tip; this is followed by eight slender accessory teeth. The right uncus has a stout ventral tooth clubbed near the tip and is followed by six long, slender accessories. The middle branch of the left manubrium is long and stout, the distal portion being strongly incurved; the middle branch of the right manubrium is short and stout. The lamellar basal elements of the manubria are large and of irregular shape.

The gastric glands are large, oblong and pigmented a dark red. The bladder and ovary are normal.

Near the posterior end of the ganglion, on the ventral side, there is a bright red mass which is often broken into several diminishing spots. The retrocerebral sac is

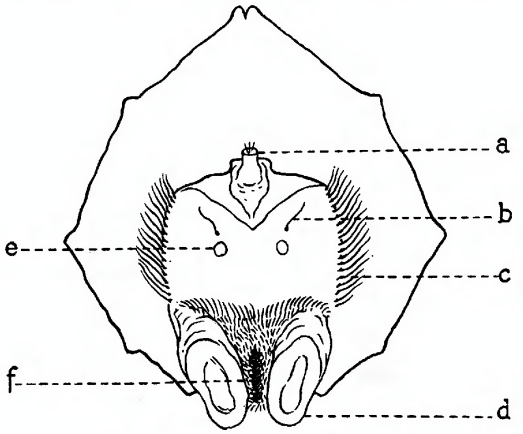


Fig. 3. *Ploesoma formosum.*

Diagrammatic frontal view: *a*, dorsal antenna; *b*, sensory seta; *c*, lateral ciliary arc; *d*, cuticular boss; *e*, duct opening; *f*, mouth.

twice as long as the ganglion and is clear and vacuolate. The retrocerebral duct is very stout and can be traced to the openings, on the apical area, which do not protrude.

Average length of lorica, 215μ; depth, 150μ; width, 140μ; length of toes, 33μ.

HABITAT.—Among and near submerged *Sphagnum* in supra-acid-water associations.

A few specimens of *Ploesoma formosum* were collected in Aunt Bettie Pond during the summer of 1928; it has not been found there since. This is probably due to lowering the surface of the water level in order to facilitate road building around the pond, thus exposing the *Sphagnum* beds among which the rotifer was found. It is fairly common in Atlantic County, New Jersey, in bodies of water the p_H of which is 6.0 or less.

The juxta-buccal protuberances are extraordinary and nothing resembling them is known among the ploimate rotifers. Because of their central evagination, it was thought that these organs might

act as extraneous factors in alimentation, but tests with carmine, on the living animal, showed no particles passing into or out of them. The dorsal antenna protrudes from a soft, cuticular hood. In *Ploesoma triacanthum* (Bergendal), *Ploesoma truncatum* (Levander), and *Ploesoma lenticulare* (Herrick), this hood has become rigid and incorporated with the lorica, which accounts for the position of the dorsal antenna in those species. The lorica is not split ventrally, as in the above-mentioned species; instead, there is an ovate opening from which the foot emerges.

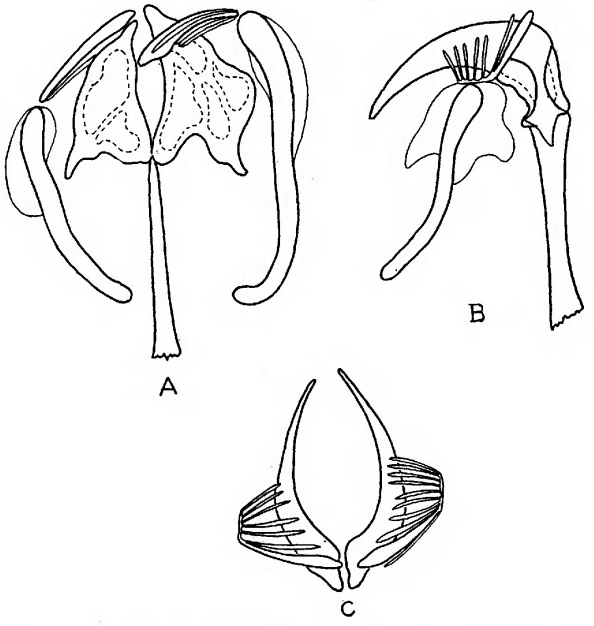


Fig. 4. *Ploesoma formosum.*
A, trophi, ventral view; B, lateral view; C, rami and unci, frontal view.

With the exception of the elevated ridges and the posterior projection, the structure of the lorica resembles that of *Ploesoma hudsoni* (Imhof), which has the same kind of fossettes but much larger. It also differs from the remaining species of the genus by having a telescopically jointed foot, and no digitiform palps on the apical area. There are, however, a pair of long setae situated just above the position of the openings of the retrocerebral duct. The mastax is less specialized than in the other species, and approaches nearer the normal virgate type, as is indicated by the preponderance of the left side over the right, and the bending of the rami at a right angle to the fulcrum, indicating a strong

pumping action. Finally, the entire body is pigmented a bright orange-red, instead of being unpigmented.

While the elements of the corona, the position of the dorsal antenna, the absence of a cleft venter and coronal palps are somewhat aberrant, the relationship is so close to the other species of *Ploesoma* that it is retained in that genus provisionally until more is learned regarding its affinities.

Family **Trichocercidae**

Trichocerca platessa, new species

Figures 5 and 6

The body is elongate, broadly fusiform dorsally, and greatly depressed. The breadth of the lorica is two-fifths, and the depth only about one-fifth, that of the length. The posterior limit of the head-sheath is indicated by a faint line of demarcation. The anterior margin is without mucrones.[1] There is no sign of a dorsal ridge and the striated area is reduced to a pair of weak muscular bands that compress the anterior portion of the lorica slightly when the head is retracted. The foot opening is small and diagonally placed. The foot is short and projects but slightly. The left toe is about one-half the length of the lorica and nearly straight. The rudimentary right toe is about one-third the length of the left; each toe has three short substyles, of varying length, attached to the base.

The dorsal antenna is tubular and emerges at a point above and halfway between the mastax and the stomach. The lateral antennae are minute tubules from which emerge tufts of sensory setae; they are situated on the dorsal side of the posterior third of the body.

The corona consists of a circumapical band differentiated into a dorsal arc of medium cilia, and two lateral arcs of longer locomotor cilia. Just below the middle of the dorsal arc there is a large, blunt digitiform process, on each side of which is a protuberance that represents the tips of the openings of the retrocerebral duct. The buccal plate is reduced to two lateral arcs of cilia, one on each side of the mouth.

The mastax is of the specialized virgate type peculiar to the genus. The construction of the trophi is exceedingly difficult to elucidate by a drawing. It is characterized by a preponderance of the left side over the right. The lateral expansions of the rami are lamellar and form a domelike cavity which helps to support the wall of the mastax during pumping action. The left uncus is joined to the ramus by a subuncus having about twelve curved, flattened teeth; the right subuncus is much reduced, and consists of five or six minute blunt teeth. The right ramus is divided into two similar halves, one being much smaller than the other; each half is surmounted by a fan of comblike teeth. The right uncus works almost between these two elements of the ramus. There are two parallel teeth in each uncus: those of the left being stout and clubbed near the tips; those of the right being long, slender and rodlike. The right manubrium is bacillar and slender, the left being somewhat longer and much stouter.

[1]The word "teeth" applied to the prominences on the anterior margin of the lorica of many species of rotifers is somewhat misleading. "Frontal mucro" and the plural "mucrones," as suggested by Mr. David Bryce, are used in these descriptions. The word is especially appropriate as the adjective mucronate is already established in English.

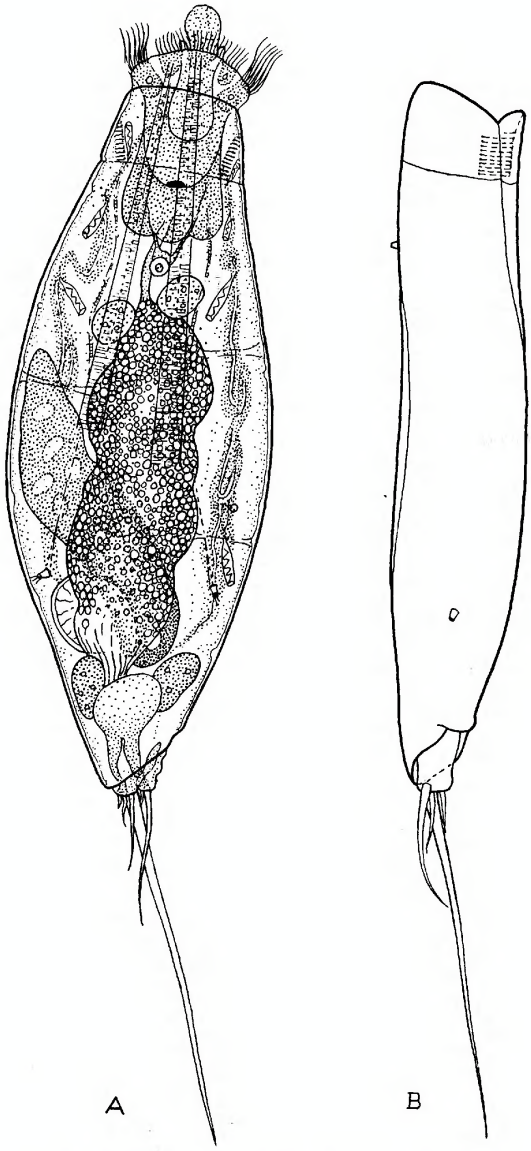


Fig. 5. *Trichocerca platessa*, new species.
A, dorsal view; B, lateral view.

The fulcrum is a long, lamellar plate which is much expanded at the tip for the attachment of the abductor muscles.

The esophagus is long and slender. The stomach is voluminous, often clear, but frequently crowded with chlorophyll granules and fat inclusions. The intestine is very short and hyaline. The nephridial tubes are pronounced and the flame cells are large and prominent, even in preserved material. The foot glands and mucous reservoir are normal.

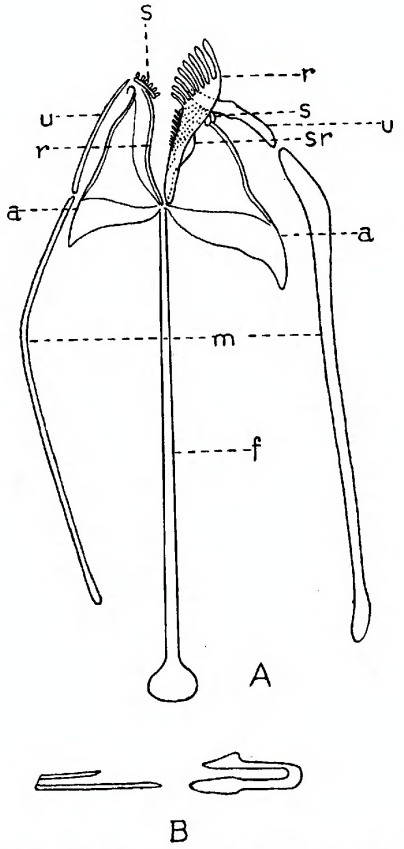


Fig. 6. *Trichocerca platessa*, new species.

A, trophi, ventral view, somewhat compressed: *r*, ramus; *s*, subuncus; *u*, uncus; *sr*, secondary ramus; *a*, alula; *m*, manubrium; *f*, fulcrum. B, unci, frontal view.

The retrocerebral sac is relatively small and is strongly vacuolate. The eye is situated at the posterior end of the ganglion.

Average length of lorica, 450μ; width, 180μ; depth, 85μ; length left toe, 240μ; right toe, 77μ.

HABITAT.—Littoral region of permanent bodies of neutral and acid water.

Trichocerca platessa was first collected in Atlantic County, New Jersey, in 1914. It seems to be fairly common where conditions of exist-

ence permit. Besides being found on the Island, it has also been collected in Polk County, Florida; the Pocono Mountain Plateau, Pennsylvania; Caroga Lake, New York; and Vilas County, Wisconsin.

While the rotatoria are potentially cosmopolitan, this species maybe endemic. It seems hardly possible that a rotifer so large and distinctive should remain unobserved outside of the United States for such a long period of time.

The species bears a certain resemblance to *Trichocerca rattus* (Müller) and *Trichocerca elongata* (Gosse). It differs from both in its greater bulk, by the strongly depressed body, and by the differences in the trophi.

Trichocerca platessa is very swift and active in its movements, revolving on its long axis but slightly, which is due to the lack of a dorsal keel and any decided twisting of the lorica. It is frequently infested with the parasite *Pilistophora brachionus* Budde. It is a curious sight to see this rotifer moving about aimlessly, propelled by the involuntary action of the coronal cilia, while the body-cavity is apparently empty except for the presence of numerous parasites.

Trichocerca ornata, new species

Figure 7

The body is short and stout; the anterior portion is clear, and the remainder of the lorica is marked by numerous closely set pustules. There are two small frontal mucrones situated on the anterior margin. The striated area is bounded laterally by two low ridges and extends some distance to the rear of the middle of the body. The foot is quite long and tubular; it is protected by a cylindrical prolongation of the lorica which has a blunt mucro, situated at the posterodorsal edge. The left toe is about equal to the lorica in length; it has a slight bend a short distance from the base, somewhat like the left toe of *Trichocerca stylata* (Gosse) and *Trichocerca pusilla* (Jennings). There is a very short, rudimentary right toe which is closely appressed to the left, and several minute substyles are clustered about the base of each toe.

The circumapical band is reduced to two lateral and one dorsal arc of long cilia. The buccal field is sparsely ciliated and roughly triangular; it is bounded by two lateral arcs of stronger cilia. There is a prominent digitiform process, situated on the apical area, which is bounded laterally by two setiferous tubules.

The mastax is asymmetric and of the specialized virgate type peculiar to the genus. In view of its small size, and other easily ascertained differences, the trophi were not studied in detail.

The eyespot is cervical, and the remaining anatomy is normal.

Length of lorica, 95μ; left toe, 100μ; right toe, 12μ; total length, 210μ.

HABITAT.—Among marginal aquatics in permanent bodies of neutral and acid water.

Trichocerca ornata is fairly common and evenly distributed throughout the Island. It is common in Atlantic County, New Jersey, and has

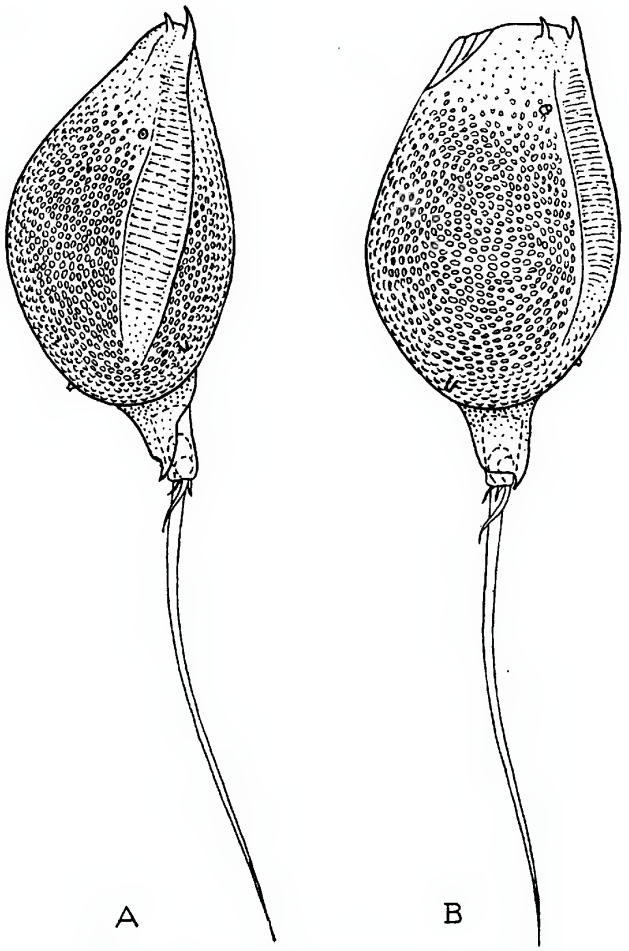


Fig. 7. *Trichocerca ornata*, new species.
A, dorsal view; B, lateral view.

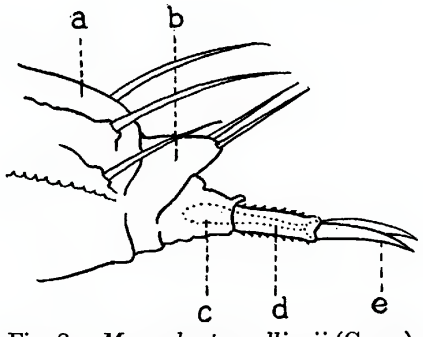


Fig. 8. *Macrochaetus collinsii* (Gosse).
Lateral view of posterior portion of body, foot, and toes: *a*, dorsum; *b*, posterior lobe; *c*, first foot joint; *d*, terminal foot joint; *e*, toes

also been collected among *Nitella* near the outlet of Caroga Lake, New York. This species is related to *Trichocerca bicuspes* (Pell), from which it differs mainly by having two frontal mucrones, the thick ornamented lorica, the tubular lateral antennae, and the tubular posterior prolongation of the lorica, protecting the foot.

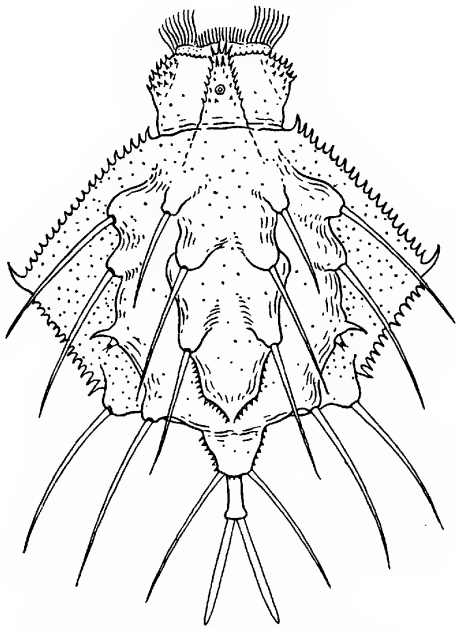


Fig. 9. *Macrochaetus multispinosus*, New species. Dorsal view.

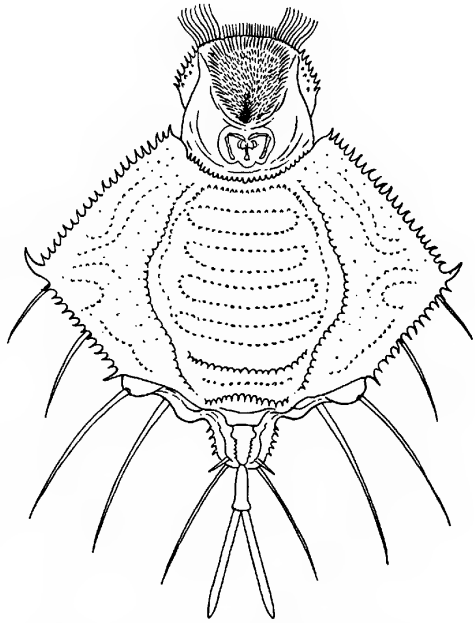


Fig. 10 *Macrochaetus multispinosus*. Ventral view.

Family **BRACHIONIDAE**

Subfamily **Brachioninae**

Macrochaetus multispinosus, new species

Figures 9 and 10

The body is broad and short, strongly hexagonal, compressed dorsoventrally and widest across the middle. The dorsum is arched and the venter is slightly convex. The surface of the lorica is finely punctate, and the lateral edges are bounded by numerous closely set spinules. The lateral angles are very acute, each having a prominent spinule at the summit. There are fourteen long dorsal spines which project from prominences; a pair also project from the lateral angles of the posterior lobe.[1] The venter is rather flat and is ornamented by a series of minute spinules, the

[1]The reduced posterior portion of the dorsum in this genus has previously been mistaken for the first foot joint. It is an integral part of the lorica, lying above the foot and is analogous to the posterior lobe in the genera *Lecane* and *Monostyla*. Figure 8 is a lateral view of the posterior portion of the lorica of *Macrochaetus collinsii* (Gosse) and shows the posterior lobe above the basal foot joint.

pattern of which is constant. The foot is composed of two subequal joints. The toes are long and slender, being equal to the foot in length.

On the dorsal side, the head opening is poorly defined, being soft and flexible; the ventral anterior margin of the lorica is concave and beset with a range of numerous spinules. The central ridge and lateral portions of the dorsal hood of the head are also ornamented with prominent spinules.

The lateral antennae emerge from prominent tubules, each being protected by a strong spine, projecting over them. The dorsal antenna is normal.

The mastax is malleate, and the remaining anatomy is normal.

Length of lorica, 60μ; terminal foot joint, 12μ; toes, 28μ; width of lorica, 90μ; total length with head extended, 140μ.

HABITAT.—Littoral region of lakes and ponds in which the p ranges from 6.6 to 7.2.

Macrochaetus multispinosus was common in the Witch Hole and Lake Wood during several summers. It has been found also in abundance in Atlantic County, New Jersey, and sparingly in collections from Florida. The angular, hexagonal lorica, widest across the middle, and the large number of dorsal spines, together with the relatively very long and slender toes, distinguish this from any other species of the genus.

Macrochaetus longipes, new species

Figure 11

The body is broad and quadrangular, compressed dorsally and widest across the shoulders. The dorsum is arched, and the venter is slightly convex. The surface of the lorica is finely punctate, and the lateral edges are bounded by prominent spinules, those anterior to the shoulders being long, widely spaced and relatively few in number. The lateral angles of the lorica are rounded and each has a very long, prominent spinule at the summit. There are eight long, dorsal spines which project from prominences; a pair also project from the lateral ends of the posterior lobe. The venter is rather flat and finely punctate, but not arranged in a definite pattern, as in the preceding species. The foot is composed of two joints, the terminal being exceedingly slender and about three times the length of the basal joint. The toes are slender and relatively short.

On the dorsal side, the head opening is poorly defined, being soft and flexible; the ventral anterior margin of the lorica is slightly concave and beset with a range of numerous spinules. The central ridge and lateral portions of the dorsal hood of the head are ornamented with prominent spinules.

The lateral antennae emerge from prominent tubules, the base of which is bulbous, much enlarged, and ornamented by numerous spinules. This structure is the same as that of *Trichotria truncata* (Whitelegge), indicating, together with other structural similarities, the close relationship between the genera *Macrochaetus* and *Trichotria*.

The mastax is malleate, and the remainder of the anatomy is normal.

Length of lorica, 120μ; terminal foot joint, 40μ; toes, 27μ; width of lorica, 115μ; total length with head extended, 225μ.

HABITAT.—Littoral region of lakes and ponds in which the p_H ranges from 6.6 to 7.2.

Macrochaetus longipes was found during the summer of 1929 among submerged *Fontinalis* in the Witch Hole. It has been collected sparingly in Atlantic County, New Jersey, and was found also in collections from Florida. The long, widely spaced spinules of the lateral edges of the lorica, and the large, bulbous lateral antennae, together with the extremely long, slender terminal foot joint and relatively short toes, distinguish this from the remaining species of the genus.

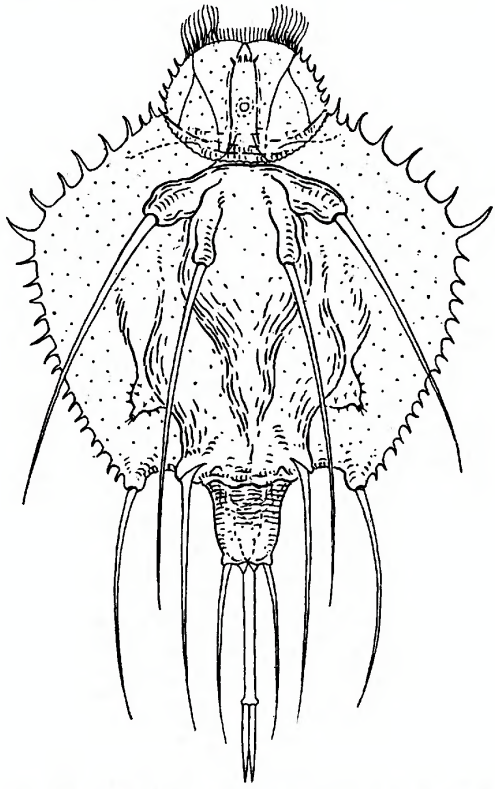


Fig. 11. *Macrochaetus longipes*, new species.
Dorsal view.

Family **BRACHIONIDAE**

Subfamily **Colurinae**

Colurella logima, new species

Figure 12

The lorica is fusiform and laterally compressed from the dorsal view; it is elongate-oval from the lateral view. The venter is split for its entire length. The width of the body, at the widest part, is about two-fifths that of the length. The foot is extremely long, being nearly equal in length to that of the lorica. The first and

second joints are relatively very short and subsquare; the terminal joint is very long and slender, its ventral edge being reinforced and very thick. On the dorsal side of the terminal foot joint, near the distal end, there is a deep sensory pit which is analogous to the same structure in the closely related genus *Lepadella*. Whether this is really the true significance of the structure cannot be definitely established, but it is at least not impossible, reasoning from similar structures in other genera of rotifers. The toes are nearly straight; their length is about two-fifths that of the lorica.

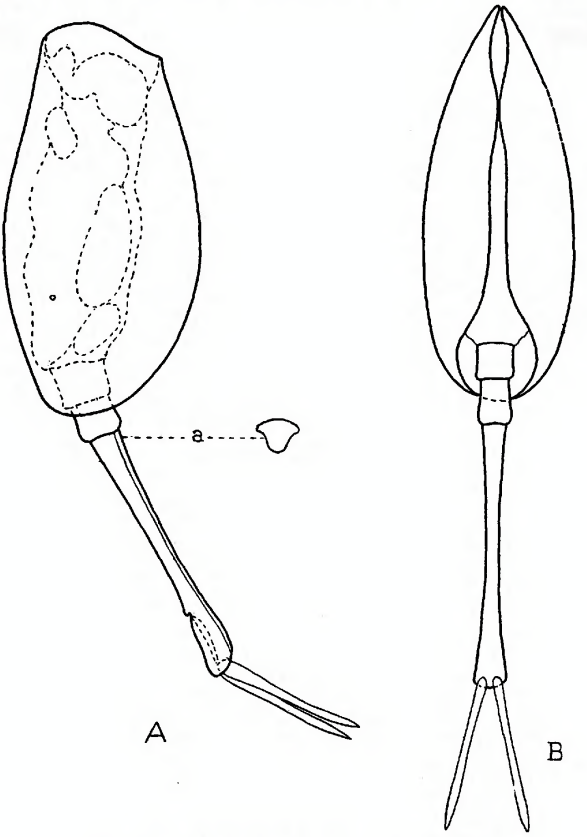


Fig. 12. *Colurella logima*, new species.
A, lateral view: *a*, cross-section. B, ventral view.

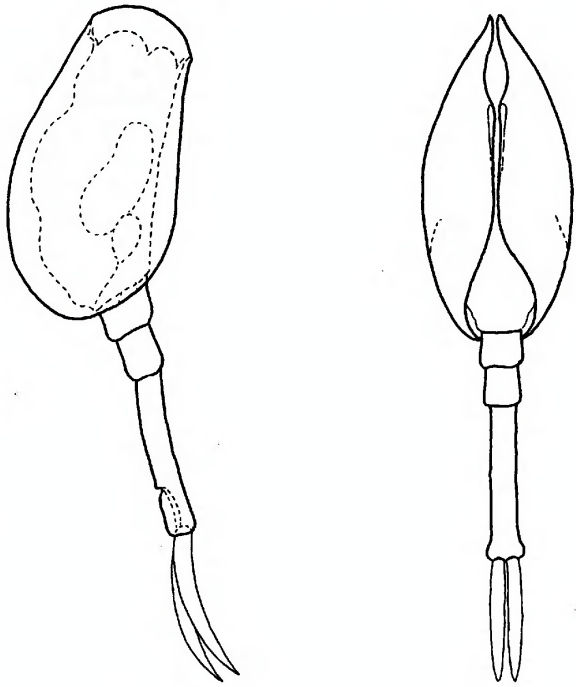
The mastax is malleate, and the internal anatomy is normal.

Length of lorica, 150μ; first foot joint, 18μ; terminal foot joint, 115μ; depth of body, 80μ; width of body, 60μ; length of toes, 60μ.

HABITAT.—Submerged *Sphagnum* and *Fontinalis* in permanent bodies of acid water.

Colurella logima was found sparingly in Aunt Bettie Pond and the Witch Hole. It occurs also in Atlantic County, New Jersey. While agreeing perfectly with the other species of the genus in the lorica and

general anatomy, it is strikingly different in the shape of the foot and toes. Its nearest relative is *Colurella aemula* Myers (the following species), from which it may be distinguished by its greater size, and the relatively much more slender and longer foot and toes.



A B

Fig. 13. *Colurella aemula*, new species.
A, lateral view; B, ventral view.

Colurella aemula, new species

Figure 13

This rotifer differs only in details from the preceding species. It is much smaller and the lorica is softer and more gibbous above the lumbar region. The foot is relatively much stouter; the toes are blade-shaped and decurved laterally, and are straight and rather stout from the dorsal view. The habitat is the same for both species; it is more common than *Colurella logima*, which is rare.

Length of lorica, 66μ; terminal foot joint, 33μ; toes, 30μ.

Paratypes of all the new species described in this paper have been placed in the collection of The American Museum of Natural History.

BIBLIOGRAPHY

BEAUCHAMP, P. M. DE. 1912. 'Sur deux forms inferior d'*Asplanchnidés* (avec description d'une espéce nouvelle).' Bull. Soc. Zool. France, XXXVI, pp. 222–233, text figs.